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ABSTRACT

This curriculum guide is prepared for the textbook entitled "Aerospace Community," published in the Aerospace Education I series. Specific guidelines are suggested for teachers using the textbook. Major categories included in the guidebook for each chapter are objectives (traditional and behavioral), suggested outline, orientation, suggested key points, suggestions for teaching, instructional aids, projects, and further reading. Major concepts are briefly discussed with some background material. A blank sheet is included after each chapter for recording teacher ideas. (PS)

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AE-I

INSTRUCTIONAL UNIT V

AEROSPACE COMMUNITY

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SE 017 451

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INSTRUCTIONAL UNIT V

AEROSPACE COMMUNITY

INSTRUCTIONAL UNIT OBJECTIVES - When the book is completed each student should:

a. Be familiar with the organization and functions of air base facilities.

b. Be familiar with the internal and external community relations of the Air Force.

c. Be familiar with education opportunities within the Air Force.

d. Be familiar with the working relationship between the Air Force and the civilian portions of the aerospace industry.

e. Be familiar with career opportunities within the aerospace industry.

INSTRUCTIONAL UNIT V CHAPTERS:

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CHAPTER I - THE ORGANIZATION AND PLANNING OF AIR FORCE BASES

The student is introduced to the concept of the Air Force base and its dual mission--the primary mission (the reason the base exists) and the base support mission (providing base services so that the primary mission can be accomplished). A brief history is given of the development of the air base from the time of the Wright brothers to the present. Special emphasis is placed on the changes made during World War II and those required by the advent of nuclear weapons and the space age. The creation of missile sites, separated from the facilities of their support bases, is one of these changes. The student is also introduced to the concept of the master planning of Air Force bases and the questions which need to be answered before intelligent master planning can occur.

1. OBJECTIVES:

a. Traditional - Each student should:

(1) Be familiar with the difference between the primary mission and the base support mission of Air Force bases.

(2) Be familiar with the changing requirements of Air Force bases during World War II.

(3) Be familiar with the effects which the new missile and space missions of the Air Force have had on air base development.

(4) Know how modern air bases are planned.

(5) Know the six functional activities of Air Force bases.

b. Behavioral - Each student should be able to:

(1) Recognize the difference between a primary mission and a base support mission.

(2) Recall at least three examples of changes in aircraft development during World War II, which had corresponding effects on air base development.

(3) Identify two examples of new types of Air Force ground installations which did not exist before the development of nuclear weapons and space vehicles.

(4) Trace the major planning steps required for a new base.

(5) Outline the six functional activities of Air Force bases and their relationship to master planning.

2. SUGGESTED OUTLINE:

a. The Air Force Mission and Organization

(1) Primary mission and base support mission

(2) Organizational breakdown

(a) Major commands and separate operating agencies

(b) Echelons of command

b. The Evolution of the Air Force Base

(1) Pre World War I and World War I aircraft and airfields

(2) Changing requirements of World War II

c. The Effects of Missiles and Space on Base Development

(1) Missile sites

(2) Space facilities (Vandenburg AFB, CA, Patrick AFB, FL)

d. Master Planning

(1) Multimission concept

(2) Placement of facilities

e. Selecting the Site

(1) Natural and man-made site features

(2) Accessibility

(3) Availability of utilities

f. Functional Activities

(1) Airfield

(2) Industrial and administrative

(3) Community support, housing, and community recreation

3. ORIENTATION:

a. This chapter presents the development of the modern Air Force base from its beginning as a flying field of the US Army. The changes necessitated by our entry into World War II are related, as well as the changing requirements caused by the missile and space missions of the Air Force. The chapter ends with a discussion of master planning, including some of the factors which enter into the selection of sites for new bases, and the reasoning behind the layout of an air base with respect to the functional activities of the base.

b. This chapter can be used as a starting point for the preparation of the students for their visit to an Air Force base. This chapter and the chapter on "The Base as the Center of an Air Force Community" describe the base support mission and can stimulate interest among your students about what an air base is really like.

4. SUGGESTED KEY POINTS:

a. After WWI, public interest in military aviation decreased. Most of the aviation facilities were closed or converted to other purposes and budget allocations for aviation were reduced. In the later 1920's and early 1930's a few new flying facilities were constructed. Some of the existing facilities were improved to accommodate more and better airplanes. Communication and navigation equipment were developed and installed. WWII had a much greater impact on air base expansion than WWI because of the long range capability of the bomber aircraft and the supporting role of other types of aircraft. At the end of WWII, the United States had 1,895 air bases; of this number 562 were overseas.

** V-9022 pp 89-172
** V-9073 pp 15-36

b. Running an Air Force base with its support facilities is costly. Every segment of our government is expected to be as thrifty as possible, and the Air Force is no exception. Because of the tremendous savings involved, missile launch sites have been placed near existing air bases. These bases furnish technical and logistical support as well as community facilities for the missile launch crews. Much savings can be made by not duplicating housing projects and community services at the sites.

* V-9144 pp 139-142, 275-276

c. Master planning of air bases takes into account the present and future use of bases to prevent a haphazard development of facilities. A base can have an effective

expansion program if the base has a master plan showing the present composition of the base and planned future development. The plan must enable future missions of the base to be carried out efficiently and economically.

d. One of the main principles in master planning is the multimission air base concept, meaning a base might have several missions instead of just one. An air base that is planned and built to perform only one mission can become obsolete in a short period of time. The multimission concept in air base planning enables a base to perform several missions and have elements of various commands to carry out the many missions assigned to the base. The multimission air base concept reduces waste, improves efficiency of overall Air Force operation, and assures economy of operation.

* V-9054 pp 29, 65-69

e. Once a need for a base has been discussed and planned, a site selection board composed of military or civilian personnel or both is established to select the best location for a new base. A site that is to be used as an air base must be one that can provide an ideal location for all of the many facilities required to operate an air base. Many factors must be considered, but some of the main things to be examined closely by the board before their choice is submitted to Air Force officials are: topography, soil types, weather, cost of property, transportation systems in the area, existing air traffic, and available utilities.

f. Functional activities which occur on Air Force bases can be placed within the following primary categories:

* V-9054 pp 29-30

(1) Airfield--that part of the air base which is primarily devoted to the operation of aircraft.

(2) Industrial and administrative--work areas that support the operation of aircraft and supervisory offices and other buildings that provide the needed services for an operational base to function properly.

(3) Community support, housing, and recreation--living areas that provide the personnel and their families the needed services and facilities found in civilian communities.

5. SUGGESTIONS FOR TEACHING:

a. Suggested time: 2-2-4 (Translation--if you teach two academic periods per week we recommend you devote two hours to this subject. If you teach three periods per week the recommendation is still that you limit the coverage to two periods. If you teach four academic hours per week you could devote four periods to the subject. These "Suggested times" are just that--recommendations. Adjust the emphasis according to interest and talent--both yours and the students'.)

b. Define the base mission and have the students lay out an air base which meets the requirements of the mission. The base may be layed out on paper or a chalkboard as a sketch or drawing or could be built on a work table. Use tapes to represent runways and roads. The buildings and houses could be simple blocks of wood or plastic houses that are available in most homes with young children.

c. Get a base master plan from a base in your area and have the students see how it measures up against the planning criteria discussed in the book.

d. Invite a city planner or developer and a base master planner to take part in a teaching interview.

e. Have the students determine the "primary mission" of the local community, e.g., what industries are providing the major jobs, etc. How does this "primary mission" define the community and affect the planning for the town?

f. Outline the changes in any base since WW II. Try to choose an extreme case of a base changing with a different mission being added.

g. On p 31, line 4, the word maintenance is misspelled. Other typographical errors are as follows:

p 50, para 2, line 1, change "personnel" to "personal"
p 63, line 4, change "elect the make" to "elect to make"
p 84, heading, change "JOBS IN THE AIRLINE" to "JOBS IN THE AIRLINES"
p 119, Words and terms to remember, change "MEP" to "MMEP"
p 124, index (under FAA), change "contarollers" to "controllers"
p 125 index (under NASA), change "Aprenticeship" to "Apprenticeship"

6. INSTRUCTIONAL AIDS:

Films:

a. FR 842 Operation Turnkey--Tuy Hoa Air Base Construction, 38 min, color, 1967.

b. SFP 1150 The Story of an Air Force Base, 10 min, B&W, 1962.

c. SFP 1462 Air Base Master Planning--for a Better Environment, 15 min, color, 1967.

d. SFP 263-1 The Air Force Story--The Beginning, 15 min, B&W, 1953.

e. SFP 2003 Tomorrow Will Not Wait--Air, Water, and Land Conservation, 13 min, color, 1970.

7. PROJECTS:

a. Compare base planning with planning in your local community. Have students research the function of zoning by attending a zoning session in your city and report to the class on the local zoning laws.

b. Have the students research the question "What bases or installations have been developed since WW II?"

c. Compare Army post planning to Navy base or Air Force Base planning.

d. Plan a town including its primary mission (industry, agriculture, etc.) and determine how it should be laid out. Research on the "planned cities" of Columbia, Maryland and Reston, Virginia, might be of some help. Explore differences necessitated by the function of the town--is it urban, suburban, or rural, is it a farming town, a mill town, or a college town, etc.

8. FURTHER READING:

Refer to text.

IDEAS FOR IMPROVEMENT OF THE TEXTBOOK AND/OR INSTRUCTOR'S GUIDE
AND TEACHING TECHNIQUES MOST EFFECTIVE FOR THIS CHAPTER.
TO BE COMPILED AT END OF TEXT AND SENT TO JRC

AEROSPACE COMMUNITY

CHAPTER II - THE BASE AS THE CENTER OF AN AIR FORCE COMMUNITY

The student is shown in greater detail those functions and services which constitute the base support mission. This mission is divided into two parts--base community services such as housing, medical care, and recreation, which are provided for base personnel, and base functions such as base operations, maintenance, transportation, and safety, which keep the base itself running in order to support the primary mission. Some examples of Air Force bases, their missions, and their base services are included. The student is also made aware of the worldwide locations of bases and of the strategic reasons why such a distribution is necessary.

I. OBJECTIVES:

a. Traditional - Each student should:

(1) Be familiar with the community services provided by Air Force bases to their personnel.

(2) Be familiar with the functions of an Air Force base in support of its primary mission.

(3) Know how the worldwide distribution of Air Force bases is related to our defense strategy.

(4) Be familiar with representative Air Force bases throughout the world.

b. Behavioral - Each student should be able to:

(1) Recognize at least five community services provided by Air Force bases.

(2) Identify at least five functions of an Air Force base in support of its primary mission.

(3) Describe how the worldwide distribution of Air Force bases supports our defense strategy.

(4) Recall the missions of representative Air Force bases in the U.S.

2. SUGGESTED OUTLINE:

   a. Definition of Community

   b. Base Community Services

      (1) Food and clothing

      (2) Housing

      (3) Health and medical services

      (4) Recreation

      (5) Other personnel services

   c. The Functions of an Air Force Base

      (1) Headquarters and Command

      (2) Base Operations

      (3) Maintenance Activities

      (4) Base Security and Safety

      (5) Communications and Transportation

      (6) Supply

   d. The Location and Distribution of Air Force Bases

      (1) The air base system

      (2) Representative bases

      (3) Overseas bases

3. ORIENTATION:

   a. This chapter presents life on a typical Air Force base. It describes the kinds of facilities available for the welfare of base personnel--BX, commissary, the hospital, recreational facilities including the Officer's Club, NCO Club, and Airmen's Club, the chapels, the base library, the bowling alley, and all of the facilities which would normally be found in some form in any community. It also describes the functions of the base which are necessary for support of the primary mission such as Base Operations, maintenance, etc. The chapter ends with an explanation of the need for the worldwide distribution of Air Force

bases, and examines some representative bases to show how they contribute to the overall mission of the Air Force, and how they provide base services for their personnel.

b. This chapter can help to prepare a student for a visit to an Air Force base, and can also show the similarities of life on an Air Force base to life in any civilian community.

4. SUGGESTED KEY POINTS:

a. An Air Force base commander is equivalent to and functions like a mayor or a city manager. His duties vary with the size and composition of his command. Regardless of the type of base, a commander's responsibilities are many and are constantly changing. These responsibilities can be grouped under seven basic categories in order of priority as follows: responsibilities to the mission, to higher headquarters, to collateral units, to his own unit, to individuals, to himself, and to the community. The base commander works closely with a staff of skilled specialists who advise him in their areas of expertise. These may include the comptroller, the information officer, the judge advocate, the chief of logistics, the base civil engineer, the chief of security police, the chief of supply, and others.

b. An Air Force base can easily be compared to a civilian community. Almost all services and facilities found in a civilian community can be found on most Air Force bases. Sometimes more facilities and better services may be found on an Air Force base than in the neighboring community. There are many facilities on a typical base, but two that have different names and are referred to differently than in a civilian community are:

(1) BX--provides the products and merchandise that are found in civilian shops and stores. Air Force personnel can buy clothing, hardware, appliances, equipment, etc. The items available will vary, depending on the size of the BX. It compares to a civilian department store.

(2) Commissary--provides the services of a grocery store for Air Force personnel. Most of the popular brands found in a civilian grocery store can be found at the commissary.

c. The base commander's major operational responsibilities fall in the following areas:

(1) Control tower--provides the services that enable an aircraft to land and take off at an airfield. This includes radio contact with aircraft operating in the area of the base.

(2) Base operations--provides the many services required for flying crews such as providing up-to-date maps, navigational aid charts, weather information, and lists of restricted areas. Arrangements can also be made for flight lunches and refueling of aircraft. The flight plan and passenger/cargo manifest are developed in base operations.

(3) Aircraft maintenance facilities--provides all required maintenance to keep assigned and transient aircraft maintained to perform their mission.

d. One of the most important functions of a base is performed by base supply. This component of the base provides items used extensively by all other base activities, including fuel for all aircraft and vehicles. Base supply has the responsibility for requisitioning, accounting for, storing, and distributing supplies.

e. Each Air Force base supports aerospace power, a key part of our deterrence. The present geographical distribution of our bases throughout the United States and the world insures that if one base should be attacked or lost to an enemy, the Air Force mission would still be carried out.

* V-9022 pp 277-285
** V-9054 pp 21-30, 49-69

5. SUGGESTIONS FOR TEACHING:

a. Suggested time: 2-3-4

b. An alternative to short lectures might be to have students role-play the parts of a base commander and his staff--having a staff meeting. They could decide on a problem which must be solved and show how each member of the staff contributes to the solution. (A real world example might be the Project Homecoming effort to welcome back the POWs--base commanders had a great deal of extra planning to do and were limited on the amount of money they could spend because the money had not been allocated in their budgets.)

c. Invite a base commander and the local mayor (or their representatives) to take part in a teaching interview.

d. Have the students give one-minute talks comparing a base function to a similar function of city government.

e. Obtain ASVA 55-1, the map of "USAF Active Major Installations." Have the students update it and explore the question of base closings. Have them breakdown into buzz groups to discuss the resistance of the townspeople to base closings.

6. INSTRUCTIONAL AIDS:

a. Films:

(1) SFP 1150 The Story of an Air Force Base, 10 min, B&W, 1962.

(2) SFP 355 We Saw It Happen, 58 min, B&W, 1954.

b. Slides:

V-0089 Aerospace Community

c. Chart:

AVAS 55-1

7. PROJECTS:

a. Have a student report on the organization of the local city council or town government and compare it to a base commander's staff.

b. This chapter could end with a field trip to an Air Force base.

c. Compare the support mission of Air Force bases (to support flying and fighting) to those of Army posts and Navy bases (to support land and naval fighting). How would base requirements and base functions differ with these missions?

d. If there are fastburners or makeup students in the class who are looking for projects have them write to an overseas AFJROTC unit fo information on bases in their area. Another project would be to make maps of overseas bases using the May 73 Air Force magazine as a guide.

8. FURTHER READING:

a. Air Force Magazine, May 1973.

b. Refer to text.

IDEAS FOR IMPROVEMENT OF THE TEXTBOOK AND/OR INSTRUCTOR'S GUIDE
AND TEACHING TECHNIQUES MOST EFFECTIVE FOR THIS CHAPTER.
TO BE COMPILED AT END OF TEXT AND SENT TO JRC

AEROSPACE COMMUNITY

CHAPTER III - AIR FORCE COMMUNITY RELATIONS AND EDUCATIONAL OPPORTUNITIES

The student is introduced to Air Force community relations including recent developments in the Domestic Action and Social Actions programs. Domestic Action is concerned with relations between the Air Force community and the civilian community, in which individuals or groups of Air Force personnel become involved in community activities of a problem-solving nature. Social Actions is a program designed to deal with the "people" problems which arise within the Air Force community itself, such as drug abuse or discrimination. The educational opportunities described in this chapter include the AFROTC program, the Air Force Academy, the Community College of the Air Force--a new development in the Air Training Command which gives college credit for training courses taken by Air Force personnel--as well as many other programs. These educational opportunities are mentioned so that the student will realize the value the Air Force places on continuing education.

1. OBJECTIVES:

   a. Traditional - Each student should:

      (1) Know the goals and some of the accomplishments of the Air Force Domestic Action program.

      (2) Know the activities of the Air Force Social Actions program and the problems it was designed to deal with.

      (3) Know the purpose, scope, and benefits of the AFROTC program.

      (4) Be familiar with the purpose of the Air Force Academy and the opportunities it provides to qualified students.

      (5) Be familiar with the Community College of the Air Force, the reasons why it was set up, and what it accomplishes.

      (6) Be familiar with the Airman Education and Commissioning Program (AECP), Extension Course Institute (ECI), Air Force Institute of Technology (AFIT), and the benefits of the GI bill.

   b. Behavioral - Each student should be able to:

      (1) List the goals of Air Force Domestic Action.

      (2) Outline the accomplishments of the Air Force Domestic Action program.

(3) Recognize the Social Actions program and some of the problems it was designed to deal with.

(4) Outline the purpose, scope, and benefits of the AFROTC program.

(5) Recall the purpose of the Air Force Academy and the opportunities it provides.

(6) Recognize some of the benefits of the Community College of the Air Force.

(7) Describe briefly the AECP, ECI, AFIT, and GI bill benefits.

2. SUGGESTED OUTLINE:

a. Community Relations

(1) Domestic Action

(a) Education and training

(b) Health and medical

(c) Recreation and entertainment

(2) Social Actions

b. Education Opportunities

(1) AFROTC

(2) Air Force Academy

(3) Community College of the Air Force

(4) Other educational opportunities

3. ORIENTATION:

a. This chapter includes current information on two important aspects of the modern Air Force--its involvement in internal and external community problems and the education opportunities it makes available to Air Force personnel.

b. The information included on Domestic Action and Social Actions can provide a background for study in this area, however the changes are occurring rapidly, and each day new Domestic Action programs are springing up. A good way to approach this subject

is to find out what programs local bases are involved in. The instructor may want to include this portion of the chapter in leadership education, where he can expand on the need for leadership to deal with these problems.

c. Education opportunities will probably be most interesting to those students who are planning on entering the Air Force, or going to the Academy or through AFROTC. Other students, however, may become motivated to plan on how they will continue with their education wherever their interests lie.

4. SUGGESTED KEY POINTS:

a. Individual servicemen and groups of servicemen have always been involved in "social" programs--from the Big Brother program to organized efforts at providing disaster relief. The decade of the 60's saw an increasing awareness by all groups in America for the need to solve America's social problems--pollution, discrimination in jobs and housing, poverty, inadequate health care, drug addiction and others. The first organized attempt to make the Defense Department responsible for solving some of these problems came under the Johnson Administration when Robert McNamara was Secretary of Defense. One of the earlier projects was Project 100,000 initiated on 1 October 1966 whereby the DoD lowered the mental standards for draft eligibility. It was believed that by placing a percentage of substandard recruits into the Army, Navy, and Air Force, these recruits could perform their military obligation and at the same time acquire special education and training which would help them find jobs after they left the service and help raise them out of their chronic poverty. Approximately 100,000 men were taken during the first two years of the program and 95% of them successfully completed basic training, however criticism of the program from within the military has caused the program's demise.

Project Transition, another McNamara program which is now being phased out, aids servicemen who are about to be discharged prepare for a job in the civilian world. The program has included counseling, education and training, and job placement services. Conducted in cooperation with the Labor Department, the program was designed to fill glaring needs in the civilian job market such as the acute need for civilian police.

Secretary McNamara also moved to desegregate housing and other public facilities near military bases. In 1967 he placed all housing and public facilities which were segregated off-limits so that no military personnel would use facilities not open to all military personnel. In the area of equal employment the Defense Department became part of the larger federal program which withholds or cancels contracts with companies which practice discrimination.

These four programs provided the foundations for the Domestic Action program. The programs have been criticized by some for going beyond the mission of the Defense Department. Others have criticized the programs, particularly the equal employment program, for failing to live up to their goals. Without question, however, these programs have had a profound effect in shaping Defense Department actions since that time.

b. Secretary of Defense Clark Clifford, McNamara's successor, expanded the helping role of the Department of Defense in solving society's problems by stating that in his opinion total national security required improved social institutions and full participation by all citizens in a sound economy. Secretary of Defense Melvin Laird embraced the Clifford philosophy when he took over that job, and on 26 April 1969 announced the creation of a Domestic Action Council composed of "high level officials from the Office of the Secretary of Defense, Joint Chiefs of Staff, and military services to insure a widespread, coordinated approach to the Department's Domestic Action program."

c. The Air Force Domestic Action program, like the larger DoD program of which it forms one part, is divided into six major categories of endeavor, four centralized at Air Force level and two decentralized. The four centralized areas are procurement, manpower, transfer of knowledge, and use of assets. These areas tend to be national in scope and require specialized management.

(1) Procurement--The goal of domestic action in the procurement area is to actively encourage minority-owned businesses to seek and obtain defense contracts. Since FY 1969 the amount of DoD contracts awarded to minority businesses has steadily increased and totaled over $30 million in FY 1972. DoD does not deal directly with these businesses but negotiates contracts with the Small Business Administration which then subcontracts to minority businesses. The Air Force concept is to get as many different minority firms as possible involved, rather than to award just a few large contracts. The DoD plan benefits not only the owners of these minority businesses, but also their workers who tend also to be members of minority groups.

(2) Manpower--Project Transition, mentioned earlier, is an example of a manpower program which was designed to insure that a departing serviceman had developed a viable skill which would be useful to him in the civilian job market. The REFERRAL program, Project HIRE, and Project VALUE are other examples of programs which fall in this broad area. Project VALUE, which works in cooperation with the Labor Department, tries to tackle the problem of the hardcore unemployed and provide

summer jobs and job training on military installations for disadvantaged youths. Hill AFB in Utah developed an employment program for young people in the local Indian tribes. Offutt AFB, Nebraska, runs a vocational work study program in which young people learn job skills and then use them in an on-base job. At McClellan AFB in California a similar vocational program is staffed and funded by the local school district. Students in the program attend school for half a day and work on base half a day receiving on-the-job training from regular workers. The manpower projects involving students in the surrounding communities of Air Force bases are decentralized projects, although others such as PROJECT TRANSITION have been centralized.

(3) Transfer of Technical Knowledge--The aim of this program is to share the advances in technical knowledge made by the Air Force with other government agencies in an attempt to solve problems. A demonstration housing project developed at George Air Force Base, California, for example, yielded new ideas on how to build livable, quality housing with a cost savings of from 15-20%. Advances in infra-red photography, used in military reconnaissance, have helped cities map population patterns and pollution problems quickly. One of the largest transfer programs is MAST (Military Assistance to Safety and Traffic) where the services have aided local police departments in responding to medical emergencies such as automobile accidents. Medically equipped helicopters can respond to calls for help quickly. The services have provided both the helicopters and the personnel to be used for such emergencies and also have helped local police departments develop their own aeromedical evacuation capabilities by training police in the use of helicopters.

(4) Use of Assets--The equipment and facilities of Air Force installations are being used to support Domestic Action when not being used in their primary mission. Additionally, as bases close in the phasedown from a wartime to a peacetime stance, the Office of Economic Opportunity (OEO) and the Department of Health, Education and Welfare (HEW) have been major beneficiaries. The military facilities are being used for a wide variety of civilian programs.

d. The remaining two categories of Equal Opportunity and Community Relations are more decentralized, involve the efforts of individual servicemen and women, and may vary at different bases.

(1) Equal Opportunity--Equal Opportunity, although defined as a function of Domestic Action is partly grounded in the Air Force Social Actions program. Part of Equal Opportunity goes

back to McNamara's efforts in placing housing and public facilities which discriminate off-limits to military personnel and in refusing to grant government contracts to companies which practice discrimination. However, individual base commanders and equal opportunity officers play a large role in insuring that all base personnel are treated fairly, both on base and off. Courses in race relations are conducted on base to provide and enhance equal opportunity, to reduce racial tensions and frustrations, and to prevent violence.

(2) Community Relations--Community relations is the broadest of the six Domestic Action areas, covering a wide variety of programs. Here, military personnel become involved in the problems of surrounding civilian communities. The Air Force guidelines in this area are for the military to work with local groups, not to use military funds, to supply services, equipment and facilities within legal limits, and to be innovative. It draws its manpower from volunteers who donate their off-duty time. The programs which bases are supporting are as varied as the areas in the country in which the bases are located. It is estimated that about 7-1/2 percent of the Air Force has gotten involved in voluntary domestic action programs within their communities. Some recent examples--

> A dentist stationed at Hill AFB, Utah, makes weekend visits to Indian reservations in Nevada and Utah to provide free dental care. He has obtained obsolete Air Force dental equipment, renovated it, and has set up a dental office for this purpose. He flies his own aircraft at his own expense to make trips to the remote sites each weekend.
>
> At Bolling AFB in Washington, DC a Youth Base has been set up to house 15 boys with delinquency records and provide them with good housing, guidance, and companionship. The counselors assist the boys in getting jobs or going to school. A day camp is in the planning stages which will operate for five weeks in the summer and provide 25 inner city boys the chance to participate in athletic and recreation activities on the base, including use of the swimming pool.

Domestic Action programs are found throughout the country and new ones are beginning every day.

e. The work of the Air National Guard (ANG) and the Air Force Reserve (AFRES) in Domestic Action deserves special mention because of the unique relationship which the ANG/AFRES enjoy with civilian communities. Guard and Reserve units are integral parts of the communities from which they draw their members. This interaction is

demonstrated through Domestic Action. Domestic Action can in many cases provide good training for these units. Combat readiness has the first priority, but disaster relief has always been a National Guard mission. In addition, when a Domestic Action project can contribute to the development of unit or individual skills, it can be performed during training periods and supported by training funds. The philosophy behind this approach was explained recently by Dr. Theodore C. Marrs, Deputy Assistant Secretary of Defense (Reserve Affairs) who stated:

> It is far better training for a unit to grade a playground, clean a pond, improve a roadway in a park, or build a picnic shelter--than to dig and fill holes in the armory yard or rip up and lay down the same square of pavement at a training site. It is far better training for a medical unit to assist public health authorities to perform physical examinations and give immunizations than to have its members watch films or listen to lectures which explain how to do these very things.

One such mission was undertaken in Lowell, Massachusetts and the local Air Force Reservists played a major role. 2755 Lowell children received innoculations against German measles, regular measles and polio, thanks to the 94th Military Airlift Wing and its 901st Support Squadron and the Model Cities Agency of Lowell who organized the immunization program.

The National Guard is also starting to play a major role in DoD efforts to assist the US Environmental Protection Agency (EPA) in a nationwide water-sampling effort. This National Eutrophication Survey involves taking monthly water samples of 240 lakes in the northeast and northcentral region and will soon include another 200 lakes east of the Mississippi. The study will pinpoint water bodies most in danger of pollution damage. The EPA plans to provide assistance in developing control techniques when the pollution sources have been identified.

Other ANG/AFRES projects have ranged from sponsoring Little League baseball teams and holding Christmas parties for disadvantaged children to assisting in the reconstruction of a church in North Pole, Alaska--an activity conducted by members of the 939th Civil Engineering Flight at McChord Air Force Base, Washington, while on their two-week active duty training at Eielson Air Force Base, Alaska.

A Reserve unit at Hill AFB, Utah, has flown many missions air-- lifting hay and feed to starving cattle and sheep on nearby Navajo reservations after winter blizzards. Another Reserve unit in Arizona is conducting a desert survival class for local citizens.

The work of units of the Guard and Reserve in disaster relief projects is particularly noteworthy. During a mine disaster at Kellogg, Idaho, in May, 1972, Reservists airlifted eleven tons of seismic listening equipment and five mining experts into the area. They have assisted the US Forestry Service in fighting fires, have saved countless lives during floods, and in the wake of Hurricane Agnes they delivered 584,000 pounds of relief supplies to areas hardest hit by the storm. Guard and Reserve volunteers delivered an additional 1,200,000 pounds. Domestic Action projects not undertaken as a part of ANG/AFRES training can be done by volunteers in their off-duty time, as is the case in the active duty Air Force.

Major General Homer I. Lewis, Chief of the Air Force Reserve, recently described a career in the Air Reserves, which could also apply to the Air National Guard as well as the active-duty Air Force. "For humanitarian, yet pragmatic reasons, all Reservists should welcome and act on every worthwhile opportunity for hometown service in the 1970's. Our communities need us and we need our communities, for without our help they may not be able to solve some of their service social problems and without them we may not even survive."

f. Although already mentioned under Domestic Action, equal opportunity is one of the main thrusts of the Social Actions program. Other social problems which may arise on bases such as racial incidents or drug abuse are also diagnosed and hopefully remedied by Social Actions. Education in race relations is one of the primary responsibilities of a base Social Actions office. All military personnel are presently required to receive 14 hours of race relations training annually. Before instructors start to teach on a base they attend the Defense Race Relations Institute at Patrick AFB, Florida.

Another achievement made by many base Social Actions offices is the establishment of a hot-line program which allows a person with a problem to talk about it with an understanding person. The original idea was to allow drug users an opportunity to seek help, however many callers have several big problems. Advice on drugs had to be expanded to include all types of human relations counseling. Trainees in Social Actions attend a month long course at Lackland AFB, Texas, which stresses identification of social factors behind drug abuse and alcoholism.

g. Education opportunities are one of the greatest benefits an individual can receive from an Air Force career. From AFROTC scholarships to the GI Bill benefits, Air Force personnel are given opportunities to complete their education. Of special interest is a new Air Force concept, Community College of the Air Force, which gives college credit towards a Career Education Certificate for

some of the training received by airmen at ATC technical training centers. This Certificate can be shown to future employers or college registrars when an individual separates from the Air Force as proof of the education and training he has already received. The CCAF will also keep a record of courses taken at civilian colleges and document all courses taken on one unified transcript. This can be a significant aid to an airman who has served at more than one base and attended more than one college.

h. The new AFROTC program offers a greater opportunity for scholarships, a larger subsistence allowance for all Professional Officer Course (POC) cadets, the option of completing a two year course plus field training, instead of a four year course, and the inclusion of women in the formerly all-male program. The Air Force Academy offers the exceptional student a full scholarship to one of the best colleges in the country and the chance to become a Regular Air Force officer.

i. The textbook mentions two separate airmen commissioning programs which have been combined since the text went to print--AECP and Operation Bootstrap. Current details on the new combined AECP can be found in the Oct 73 issue of Air Force magazine in the article "New Airman Education and Commissioning Program." The new program combines three existing programs--the Airman Education and Commissioning Program (AECP), Airman Commissioning Program (ACP), and Operation Bootstrap. The age limit for eligibility has been extended slightly and this should boost the enlisted man commissioning by 300 slots annually, from the former goal of 700 to 1000. This would make AECP a greater source of commissioned officers than the Air Force Academy. The Air Force has found prior service officers to be highly effective, career-minded, and dedicated, with the best retention record for any commissioned category. Thus, although new officer commissioning as a whole is dwindling, there is a planned increase in this one area.

5. SUGGESTIONS FOR TEACHING

a. Suggested time: 2-3-4

b. A short introductory lecture by the instructor could cover the community relations portion of this chapter. Depending upon the interest of the students, the ideas of Domestic Action and Social Actions could be further discussed in Leadership Education. As AFJROTC leaders, the cadets should be aware of the problems which Air Force leaders face, since many of them are the same (drugs, racial tensions) as those found in high schools. The students could break down into buzz groups to discuss AFJROTC relations with both the external community--the high school and the city

in which they live--and the internal community of the AFJROTC unit itself, and search out ways to improve these relations.

c. A resource speaker from a local ANG/AFRES unit could brief the cadets on the role they are playing in the Air Force Domestic Action Program.

d. Equal Opportunity Current News, published periodically by Headquarters USAF, combines the leading news stories about equal opportunity. This could provide you with current background information.

e. The education opportunities could be adequately covered by lecture with perhaps some student discussion about their education plans. For those students who are interested in the Air Force Academy and AFROTC, movies are available on these subjects.

f. A field trip to a local AFROTC detachment would show AFROTC in action and would allow an interchange between junior and senior cadets.

g. The 1974 AFA Scholarship Package contains a good deal of information on USAF Domestic Action programs, and could provide you with some further background material.

6. INSTRUCTIONAL AIDS:

Films:

a. AFN 31 Air Force Now No. 31, 20 min, color, 1972, focuses on recent Domestic Action programs.

b. SFP 2096 Blackman, 39 min, color, 1972, discusses race relations in the Air Force.

c. AFIF 177 Trip-Trip to Where, 50 min, color, 1968, this film discusses drug abuse and what it leads to.

Several other good films are available on the subjects of race relations and drug abuse which are shown to Air Force personnel as a part of Social Actions education (See AFM 95-2). Also, several AF Now films include current information on Domestic Action.

d. SFP 1655 What Makes a Man--The USAF Academy Story, 25 min, color, 1969.

e. SFP 1684 Air Force ROTC Comes of Age, 28 min, color, 1967.

7. PROJECTS:

Domestic Action/Social Actions could be the starting point for two projects. Students could do some research and find out what their local bases are doing in these areas or they could take upon themselves as a leadership project the improvement of relations with their local community. This AFJROTC Domestic Action would be limited only by their imagination. Such a project may just involve service to their high school or it might be community-wide. Have your students report on Domestic Action/Social Actions in the Army or Navy.

8. FURTHER READING:

a. "Blue Suiters Get Involved," Lt. Charles R. Stricklin, illus Airman 17:15-17 May 73.

b. "People Count Too!" Thomas C. Steinhauser, Armed Forces Journal 109:38-41 Aug 72.

c. "Domestic Action: Past and Present," Dr. Theodore C. Marrs, Commanders Digest, pp 2-8, 29 Mar 73.

d. Race Relations Pamphlet for Commanders and Equal Opportunity Officers.

e. "Air Force Academy: A Time of Transition," William Leavitt, Air Force, Vol 56, No. 10:31-37 Oct 73.

f. "New Airman Education and Commissioning Program," Ed Gates, Air Force, Vol 56, No. 10:84 Oct 73.

g. Community College of the Air Force, General Catalog, Number 1, 1973.

h. "What AFIT Has For You," Capt. Don Carson, AIR FORCE, Vol 57, No. 1: 62-65, Jan 74.

IDEAS FOR IMPROVEMENT OF THE TEXTBOOK AND/OR INSTRUCTOR'S GUIDE
AND TEACHING TECHNIQUES MOST EFFECTIVE FOR THIS CHAPTER.
TO BE COMPILED AT END OF TEXT AND SENT TO JRC

AEROSPACE COMMUNITY

CHAPTER IV - HOW THE CIVILIAN AEROSPACE INDUSTRY FUNCTIONS

Thus far we have been primarily concerned with the Air Force community. In this chapter the student is introduced to the role played by the civilian aerospace industry and Government agencies, such as NASA, in the total "aerospace community" of which the Air Force is just one part. The relationship between the aerospace industry and its largest customers is examined, including the awarding of Government contracts. Finally, the impact of aerospace research on our society is described in some detail.

1. OBJECTIVES:

   a. Traditional - Each student should:

      (1) Be familiar with the Government departments and agencies which buy products from the civilian aerospace industry.

      (2) Know the process of Government contracting.

      (3) Know the special financial factors which the aerospace industry must deal with.

      (4) Be familiar with the industry's dependence on Government contracts.

      (5) Be familiar with at least five major benefits of aerospace research.

   b. Behavioral - Each student should be able to:

      (1) Recall the Government departments and agencies which buy products from the aerospace industry.

      (2) Outline the Government contracting system.

      (3) List four financial factors which influence the industry.

      (4) Recognize the aerospace industry's dependence on Government contracts.

      (5) Identify at least five major benefits of aerospace research.

2. SUGGESTED OUTLINE:

a. Government Purchasing

(1) The Department of Defense

(a) The Air Force--Air Force Systems Command

(b) The Army

(c) The Navy

(2) NASA

(3) Other major Government customers

b. Government Contracting

(1) Prime contracting

(2) Subcontracting

(3) Diversification

(4) Specialization

(5) Mass production

(6) Lead time

c. Aerospace Research

(1) Basic and applied research

(2) Benefits of research

3. ORIENTATION:

a. This chapter rounds out the picture of the "Aerospace Community" by introducing the civilian aerospace industry, other Government agencies involved in aerospace--NASA, the AEC, the FAA, and the National Oceanic and Aumospheric Administration (NOAA)--and the other military services. It explains how the system of Government contracting works and shows some of the financial problems the industry faces.

b. The section on aerospace research can be used to stimulate student interest in aerospace by relating the products of research

to what the student sees and experiences in his everyday life. The benefits of aerospace research can be used to demonstrate the value of the space program in areas completely unrelated to space.

c. This chapter covers the highlights of the earlier AFJROTC text Aerospace Industry and Research. If you have a background in the field, you may wish to greatly expand the coverage and time you devote to this subject area.

4. SUGGESTED KEY POINTS:

a. The Government has helped to create the aerospace industry and to bring about its gigantic development in a short time. The Government is also responsible for sustaining the industry. On an average, about 80 percent of all sales made by the industry are made to US Government agencies. This dependence upon Government agencies has made the industry subject to great changes. Industry economics depends upon crucial decisions made by the President and the Congress. These decisions, in turn, depend upon the existence or the threat of war, the political situation generally, and the thinking and temper of the American people. When a large space or defense project is cancelled or slowed down, the industry may lose millions or even billions of dollars. Usually a loss in one area, such as in space exploration, is compensated by a gain in another, such as the sale of military aircraft, but the aerospace companies suffering the losses may undergo hardship or even be driven out of business. Their personnel with valuable know-how must look elsewhere for jobs, and much valuable knowledge is lost to the industry as a result. Because of the industry's dependence upon Government contracts, some financial analysts say the industry will have difficulty in stabilizing. Most aerospace companies therefore make an effort to secure private customers and to diversify.

b. The aerospace industry works closely with Government agencies through a system of contracting. Whenever complicated systems are involved the Government makes a prime contract with one company. This company is then responsible for bringing the subsystems together and assembling them, and for testing and completing the full system. The prime contractor subcontracts with many other companies to furnish the principal components (subsystems) or management services. The prime contractor usually provides the frame for the system. Both the prime contractor and the subcontractors call upon many supply companies for small parts and ground support equipment necessary for the system. Contracts do not cover hardware alone. Many of the contracts are for "software"--ideas, research, and management services.

c. Most aerospace companies insure against loss from cancellation of Government projects either through diversification or specialization. These two methods operate in opposite directions. A company practicing diversification goes into one or more unrelated fields so that it can keep on operating and recover losses if a project is cancelled. An aircraft company might, for example, develop hydrofoils or other types of high-speed boats or sell aluminum siding for buildings. Other aerospace companies follow a program of specialization. They concentrate on the production of a few items of very special use, such as special guidance systems, so that they can compete successfully with much larger companies and win subcontracts to insure their survival.

d. All aerospace companies have to manage their resources wisely because few of them can fall back upon mass production, which was a great boon for traditional industries. The highly complex aerospace systems with their myriad parts do not lend themselves to mass production. It is not feasible to produce machine tools and set up an assembly line for manufacturing them. Usually, only a limited number of each system is produced.

e. Another problem of the aerospace industry is cutting down lead time--the time between placing the order for research and development and the time the finished item is completed and delivered. When a long lead time is required, the item may already be obsolete or at least obsolescent by the time it is delivered. The Air Force's answer to the problem is what is called concurrent management, a program of management that was put into effect when the ICBM was developed. All work for the missile system--the missile shell, its ground support equipment, the silos, the training and maintenance manuals, the fuels, the guidance equipment and all the parts--were begun about the time the original research and development for the missile was begun. All the work was to be completed at the same time. This called for a tremendously complicated system of exchanging information, of controls, and of scheduling. Computerized management systems developed as the result. These were necessary to enable industry to fulfill its contracts and for the Government to control the effort. The fly before you buy concept is in some cases superseding concurrent management, particularly in aircraft procurement.

f. Aerospace research has been undertaken on a greater scale than anything ever attempted, and the research is tightly controlled and managed. This kind of research is not, however, basically different from other research. Fundamentally, research is a quest for knowledge. Research has been important ever since the advent of modern science, and much of the research undertaken has been directed toward the improvement of technology.

g. Actually there are two kinds of research, although the dividing line between them might not always be sharp. There is basic research and applied research. Basic research is the quest for knowledge for its own sake without regard to the way the knowledge will be used. Applied research is research directed toward finding uses for knowledge discovered in the course of basic research or toward finding solutions for problems. For example, Michael Faraday was interested only in finding out what would happen if a conductor was moved through a magnetic field. He was engaged in basic research when, in 1831, he discovered that he could produce electricity by rotating a copper disk between the poles of a permanent magnet. Faraday knew that his basic research would one day have practical applications, but he did not foresee exactly what the application would be. Later, applied research produced the generator, which made possible the use of electrical machinery in factories and subsequently led to the development of all kinds of electrical appliances. Basic research is important in all fields, and it certainly has proved to be important to the aerospace industry. When Government programs are considered for funding, however, it is not always easy to sell the American public on the idea of spending vast sums of money on basic research although that public will ultimately benefit. NASA made a special effort to explain to the public the importance of building up a good solid foundation of basic research. Without such a foundation, there can be no fruitful program of research. Technology is, in its broadest sense, applied research. Technology covers the methods and procedures used in providing for man's sustenance and comfort. Research and the development of technology go hand in hand.

h. Another significant fact about aerospace research is its wide diversity. Aerospace research is concerned with all branches of knowledge--chemistry, mathematics, physics, astronomy, psychology, medicine, to name a few--and it brings this knowledge together in a way that important tie-ins can be made. By integrating specialized knowledge in aerospace research, important new discoveries have been possible, further speeding up the pace at which developments can be made. People may already take for granted some of the inventions made in the course of aerospace research, not realizing that they have been made only recently. Your students may not be aware of other developments. To understand the significance of aerospace research and its importance to the aerospace industry, you need to review briefly some of the developments brought about as the result of such research. Some of the best known developments have probably been made in fields of communications and electronics, such as the television broadcasts overseas via satellites, transistor radios, and solid-state television circuits. Fuel cells and new fuels of all kinds have resulted from aerospace research. Computers developed as the result of aerospace research are now used in a wide range of fields. They are used in making transportation and hotel reservations, in accounting and preparing

statements, in other business operations, in museums, in literary research, in "teaching machines," and in many routine operations of all types. In medicine the field of applications is especially numerous. Some examples are cryosurgery (surgery under very cold temperatures), X-ray movies, laser knives for surgery, infrared photography, radioactive injections, plastic sprays to stop bleeding, and the electronic monitoring of patients (automedic hospitals). More precise weather predictions and advanced storm warnings have been possible through the use of weather satellites. Satellites promise use for a wide variety of purposes in making observations in agriculture, ecology, forestry, geology, hydrology, oceanography, navigation, and traffic control. Practical use is soon to be made of helicopters and of V/STOL aircraft in helping to solve the problem of congestion at airports. Even TV dinners came about as a result of aerospace needs and research.

i. Even this brief review of developments from aerospace research gives some idea of the wide range of applications of aerospace research and of the impact it has had on the aerospace industry and on everyday living in the United States. The results of aerospace research are everywhere. Television broadcasts come from overseas via satellite. Weather forecasts in newspapers and ratio and television are based on information supplied by weather satellites. The pots and pans in your kitchen are coated with materials developed in the course of missile research. Plastics were largely developed as the result of aerospace research. Other developments are being made daily.

5. SUGGESTIONS FOR TEACHING:

a. Suggested time: 4-5-6

b. You may want to do some extra research and bring up timely topics in class, such as which contractors are involved in which projects. Also, the local angle can be successfully exploited by finding out how the aerospace industry in your local area is involved in Government programs and/or the production of aerospace materials.

c. For a change of pace you might try doing a "case study" on a selected aerospace company and ask the students to research the question of how it has succeeded despite the many pressures which the aerospace industry has been subjected to in recent years.

d. An idea for role-playing might be to have the students take the role of Senators and conduct a Congressional debate over the benefits derived from space and whether or not space exploration and the development of new space systems is a worthwhile expenditure of the taxpayers' money. One group could take the position that

the country must "reorder its priorities" to exclude such frivolities as space travel. For the Benefit of All Mankind: A Survey of the Practical Returns from Space Investment, House Report No. 91-1673, could be a useful source document. Another pertinent booklet published by General Electric is also entitled "...for the benefit of all mankind" and includes an updated list of space benefits. It was distributed in the summer of 1973 to all units.

Further information on benefits derived from defense-related space research can be found in the 1974 AFA Scholarship Package, particularly the news release on the subject "Defense Research--What's In It For You."

6. INSTRUCTIONAL AIDS:

Films:

a. FR 1032 Air Force Systems Command Laboratories, 27 min, color, 1969.

b. HQ 225 (NASA) Meanwhile Back on Earth, 13-1/2 min, color, 1972, explores the uses of space research.

c. HQ 207 Space in the 70's--Aeronautics, 25 min, color, 1971.

d. HQ 204 Space Down to Earth, 27-1/2 min, color, 1970.

e. HQ 219 A Man's Reach Should Exceed His Grasp, 23-1/2 min, color, 1972.

f. It's A Matter of Business, 15 min, 16 mm, 1961, design, manufacturing, and testing of a plane, Lockheed-Georgia Company.

7. PROJECTS:

a. A project for student research could be rises and declines in the Aerospace Industry from 1960-1973. Find out what projects caused the tremendous increase in the industry's size and why it took a turn downward after 1968. This report would include gathering statistics and drawing charts showing the proportion, at specified points of time, of the industry working on Government as opposed to nongovernment projects.

b. Research the "fly before you buy" concept in relation to USAF contracting to industry.

c. An interested student may want to examine in detail the structure of the Air Force Systems Command, NASA, and a leading aerospace company and find out the exact nature of AFSC-NASA-civilian aerospace industry cooperation, including the work of the Systems Command's Systems Program Office.

d. A class project could involve an Aerospace Fair in which each student could take one aspect of aerospace research (such as medicine, pollution control, etc.) which has Earth applications and together the class could prepare a display of "Spinoffs from Space" with explanations of how these spinoffs were first used in space-related activities. These spin-offs could range from objects around the house such as teflon pans or a transistor radio to charts explaining complicated medical procedures which have evolved from space research.

8. FURTHER READING:

a. Ley, Willy, Harnessing Space,

b. Vaeth, J. Gordon, Weather Eyes in the Sky,

c. Bernardo, James V., Aviation and Space in the Modern World, New York: E. P. Dutton and Co., Inc., 1968.

d. Miller, Thomas G., Jr., Strategies for Survival in the Aerospace Industry, Cambridge, Mass.: Arthur D. Little, Inc., 1964.

e. Ordway, Frederick I. and Others, Dividends from Space, New York: Crowell, 1971.

f. Purcell, W.A., Jr., (Ed.), Commercial Profits from Defense-Space Technology, Boston: The Schur Company, 1965.

g. For the Benefit of All Mankind: A Survey of the Practical Returns from Space Investment, House Report No. 91-1673.

h. "...for the benefit of all mankind," booklet published by General Electric Company.

i. Current issues:

Aerospace
Spaceflight
Aviation Week and Space Technology
Air Force

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AEROSPACE COMMUNITY

CHAPTER V - CAREER OPPORTUNITIES IN AEROSPACE

Chapter V is an overview of jobs available in the aircraft and space fields. First the civilian sector is examined, including jobs with the commercial airlines, jobs in manufacturing, and jobs in research and with the Government. The second half of the chapter is devoted to jobs in the Air Force and it attempts to be representative rather than complete. The chapter also includes an introduction to the officer and enlisted promotion systems.

1. OBJECTIVES:

   a. Traditional - Each student should:

      (1) Be familiar with job opportunities in the civilian sector of the aerospace industry.

      (2) Know the jobs of rated Air Force officers.

      (3) Know at least five nonrated officer jobs.

      (4) Know some enlisted jobs including jobs directly related to flying and jobs not directly related.

      (5) Be familiar with the officer and enlisted promotion systems.

   b. Behavioral - Each student should be able to:

      (1) Identify at least six job opportunities in the civilian sector of the aerospace industry.

      (2) Describe the jobs of rated Air Force officers.

      (3) Describe five nonrated officer jobs including some of the duties of each.

      (4) Describe six enlisted jobs including jobs directly related to flying and jobs not directly related.

      (5) Outline the officer and enlisted promotion systems.

2. SUGGESTED OUTLINE:

a. Civilian Jobs in Aerospace

(1) Jobs in the Airlines

(a) Flight Deck Crew

(b) Ground Crew

(c) Cabin Crew

(d) Other jobs in the Airlines

(2) Jobs in Manufacturing

(a) Engineers

(b) Technicians

(3) Jobs in Research--Scientists

(4) Jobs in Government Agencies

(a) NASA

(b) FAA

(c) CAB

(d) NTSB

(e) Other Agencies

b. Career Opportunities in the Air Force

(1) Commissioned Opportunities

(a) Rated Officers (pilot, navigator)

(b) Nonrated

1. Directly Related to Aerospace

2. Not Directly Related to Aerospace

(c) The Officer Promotion System

(2) Enlisted Opportunities

(a) Flying Jobs

(b) Jobs Directly Related to Aerospace

(c) Jobs Not Directly Related to Aerospace

(d) The Enlisted Promotion System

3. ORIENTATION:

a. This chapter is designed to show a few of the many employment opportunities in aerospace, both civilian and military. It should give the student an idea of where the jobs are and the kind of training necessary to get these jobs. The second half of the chapter which deals specifically with Air Force career opportunities is the closest thing to a commercial in Aerospace Education, and should be of particular interest to students who are seriously considering joining the military. You may want to put more emphasis on the promotion systems. Students not interested in aerospace as a career should be encouraged to research career information in areas which do interest them.

b. Again, this chapter covers the highlights of an earlier AFJROTC text, Aerospace Opportunities for the Individual. If you feel more time should be devoted to careers at this time, by all means do so. Keep in mind, though, that you may want to teach a small, highly student-centered block on careers in AE III.

c. This chapter should be very student-centered, since it is aimed at getting the student thinking about his career intentions. Small group techniques such as role-playing, brainstorming, and buzz groups could be used very effectively here for letting the student express his ideas on careers or debating with other students the merits of one career over another.

4. SUGGESTED KEY POINTS:

a. There are several crews, who, working together, are responsible for the safe transport of airline passengers from one point to another. The first crew which comes to mind, quite naturally, is the flight deck crew consisting of the captain, the co-pilot, the navigator, and/or the flight engineer.

*** V-9053, pp 31-49

The captain has many duties besides piloting the plane. His work begins long before takeoff as he studies weather reports and the recommended flight plan and checks out

his aircraft. After the plane has taken off, he prescribes the speed, track, and altitude at which it will fly, monitors the work of the rest of his crew, and enters into the plane's log anything out of the ordinary which occurs on the flight, such as the illness or injury of passengers or crew members, or any damage to the aircraft.

The co-pilot or first officer is second in command, and in the event of something happening to the captain, he must take command. He alternates with the captain in performing many duties and is most directly responsible for crew and cargo. He must insure that cargo is properly loaded and he makes final inspection of the plane before takeoff, and reports the plane's readiness to the captain.

Depending on the size of the plane and the distance it must travel, a navigator may be aboard. He monitors the navigation equipment and is responsible for establishing the position of the plane during flight. He may also assist the captain and first officer in the performance of their duties.

The flight engineer is responsible for aircraft engines, which must be closely monitored during flight. He is particularly concerned with fuel consumption. As it burns, he must insure that the weight of the remaining fuel is evenly distributed--no small job considering that fuel may be consumed as rapidly as 1-1/2 tons per hour. He is also responsible for monitoring all the other fluids which the engine uses such as oil, hydraulic fluid, alcohol, and water and is, in general, responsible for maintenance during flight.

b. The cabin crew, the next most obvious crew, insures the safety and well-being of the passengers. A cabin crew may consist of a flight steward and/or stewardesses who together cater to the passengers' comfort, prepare and/or serve meals on the flight, and insure that adequate passenger safety precautions, such as seat belt fastening, are being accomplished.

*** V-9054, pp 31-49

c. Aviation positions may be either flight positions or ground positions. Only 36 percent of the airlines employees are classified as flight personnel. Therefore, for every person directly engaged in flying, there are two on the ground supporting him and the airline operation. Although the flying positions are generally more glamorous than ground positions, the two are complementary, and both are necessary to smooth operations.

* V-9012, pp 309-313
** V-9053, pp 26-49
** V-9071, pp 67-120

d. The ground crew includes the maintenance personnel who insure that the airplane is airworthy. Other ground jobs include those of traffic representative, airline dispatcher, airlines accountant, and architectural draftsman. All of these people contribute to making air transportation possible.

e. In the area of space, the career field which gets most closely involved with the development of new space systems is that of engineering. There are many types of engineers, because space vehicles are so complex that they require the coordinated efforts of many.

** V-9016, pp 21-22
*** V-9040, pp 41-44

Another occupational classification that is indebted to aerospace research for its growth is that of the scientific or engineering technician. Technician status is inviting to many people who are scientifically inclined but who, for one reason or another, do not complete the full college course required to become a full-fledged engineer. Technicians are important members of aerospace research teams.

** V-9040, pp 94-99

f. Work done in research centers, colleges, and universities is essential to the aerospace program. This work is sponsored by Government, by industry, and by private foundations. The profit motive (and the salaries) may be less here than in industry, but the atmosphere may be more conducive to pure research. Experience in these institutions can earn rewards if the decision is made to go into industry.

** V-9012, pp 191-195

g. Careers in both the aviation and the space segments of aerospace are found in Government agencies. Government support, interest, and regulation is felt even in non-Government areas of aerospace. The primary Government employers in space are NASA and the Department of Defense, although many other Government agencies are involved. Aviation opportunities are found throughout the nation in all levels of government.

h. Air Force success is more and more dependent on team effort by the "Aerospace Team" of ground and air crews, backed by support outfits. This team is made up of officer and enlisted personnel, of which both groups have a wide choice of aerospace opportunities. All commands of the Air Force are concerned with aviation, some less directly than others. The Air Force has emerged as the dominant service in military space work, done under Air Force Headquarters and the Air Force Systems Command.

** V-9012, pp 113-115, 119-131
* V-9016, pp 121-124
** V-9054, pp 31-48, 143-158, 171-185

i. Air Force officers are classified as either rated or nonrated. Rated officers have a rating to fly and can be pilots or navigators. Nonrated officers carry on the support mission of the Air Force, which are all of the jobs necessary to keep the rated force flying and fighting. Missile officers are also considered nonrated, however they have an operational job in the sense that they actually hold combat positions and are involved in "fighting."

j. Most officer jobs in the Air Force, except those which are directly combat-related (bombardier, missile officers, etc.) are equivalent to some position in civilian life. The transport pilot is very similar to a commercial pilot, the Chief of Security Police is like a Chief of Police on the outside. Weather officers are meteorologists, education officers may be teachers, information officers have a job not unlike the local newspaper editor. What distinguishes working for the Air Force from working for private industry is that the mission of the Air Force is the overriding consideration which ties all Air Force members together.

k. In the enlisted fields, also, most jobs in the Air Force have their counterparts in civilian life. The Air Force needs aircraft mechanics, air traffic controllers, policemen, medical technicians, plumbers, carpenters, and electricians as much as the civilian world. The Air Force is making a concerted effort to recruit people who already have these much-needed skills. The Air Force maintains a list of guaranteed jobs, and those who qualify can enlist in their chosen career field and select their jobs during basic training.

l. As the Air Force approaches the state of being all-volunteer, with none of its recruits being draft-motivated, the role of women is becoming increasingly significant. Between the years 1972 and 1978 the numbers of women in the Air Force are expected to triple. Women are an integrated part of the Air Force and not a separate corps. They are being used in a larger number of fields than previously, and are only prohibited from serving on aircraft crews engaged in combat or on missile crews. Women with skills in maintenance, engineering, computer sciences, weather, space systems, and communications-electronics, in particular, are in great demand.

m. Both the officer and the airman promotion systems are designed to recognize the best qualified personnel available. Their advancement is based on their demonstrated potential for filling positions of greater responsibility. Promotion phase points tend to be in a state of flux most of the time, however. The past several years have seen delays in promotion from E-1 to E-2 as well as from O-1 to O-2 and O-2 to O-3. Figure 55 on p 110 in the text is already outdated since primary zone consideration for promotion to 1st Lt has been changed to 2 years and promotion from 1st Lt to Captain has been changed to 4 years. The most important consideration in any promotion system, however, is the necessity for recognizing and rewarding loyalty and demonstrated ability, and this is what the Air Force is trying to do through these two promotion systems.

n. A tool which the Armed Services has developed recently, which would be useful in the career counseling of students, is the Armed Services Vocational Aptitude Battery (ASVAB). The ASVAB is a battery of nine tests selected to represent "common" content among the military service classification batteries. It is based on over three decades of military service research on classification of enlisted personnel. The battery is offered at no cost to schools or students and is administered by a trained test administrator from one of the military services. No military obligation is incurred by taking the test.

The nine tested areas are Coding Speed, Word Knowledge, Arithmetic Reasoning, Tool Knowledge, Space Perception, Mechanical Comprehension, Shop Information, Automotive Information, and Electronics Information. Five aptitude composites are derived from the results of the test and consist of General-Technical, Clerical, Electronics, General Mechanics, and Motor Mechanics. All scores and composites are reported in percentile form, and are calibrated against a national sample of youth.

The composite scores reported from the ASVAB identify clusters of abilities which are relevant to success in particular clusters of jobs. Thus, the students' better scores identify clusters of jobs he should explore and consider. Volume 2 of the ASVAB manual lists various jobs which are similar to that occupation. This guide can be used to identify occupations which the student might profitably investigate and consider in making

his/her career plans. The services wish to stimulate interest in military job and training opportunities among young people, and to convey the message that military service is not a single occupation, but rather is an environment in which a broad variety of job skills are required, and in which valuable opportunites for training exist.

o. The difference in pay between military and civilian occupations is a question which often arises. Military pay scales change periodically, however the High School News Report should keep you updated. The last available pay scales for officer and enlisted personnel effective 1 Oct 1973 was published in the November 1973 edition. You can watch for changes as they occur.

5. SUGGESTIONS FOR TEACHING:

a. Suggested time: 4-5-6

b. This chapter presents a good opportunity for having a guest speaker. One idea would be to have a speaker either civilian or military who can talk on how his job fits into the aerospace community.

c. A school resource could come from the guidance department and could be part of a teaching interview. He could explain the tools that counselors use to help people find out what jobs they are suited for.

d. Another idea for a guest speaker is a personnel manager from a local business who could answer questions on what prospective employers look for in job applicants.

e. To get this chapter down to the local level, cadets could report on jobs available for teenagers in the community, on what former Junior ROTC students are doing now, or on what vocational programs are available in the local community and what are needed.

f. Students could role-play an interview situation in which one student is the employer and the other student is seeking a job. They should be sure to touch on all relevant matters such as pay, amount of travel required, opportunities for advancement, necessary qualifications, benefits, etc.

6. INSTRUCTIONAL AIDS:

a. Filmstrips:

Aviation--Where Career Opportunities are Bright

b. Films:

(1) Air Force

(a) FR 834 Systems Engineer, 18 min, color, 1969.

(b) SFP 1241 The Air Force Nurse--A Report to the Profession, 20 min, color, 1965.

(c) SFP 1451 The Air Force Physician, 24 min, color, 1967.

(d) SFP 1311 Behind the Physician--Medical Laboratory Technology, 20 min, color, 1965.

(e) SFP 1894 Primed For Defense--The Minuteman, 28 min, color, 1970.

(2) FAA

(a) FA-01-71 Brother (minority employment at FAA), 13-1/2 min, 1970.

(b) FA-06-70 How to Succeed Without Really Flying (role of the air traffic controller), 28 min, 1970.

(c) FA-102 A Traveler Meets Air Traffic Control, 28-1/2 min, 1963.

(d) FA-701 The Inspectors, 25 min, 1969.

(3) NASA

(a) HQ 120 The Hard Ones (shows the engineering problems of designing, building, and testing satellites), 15 min, 1965.

(b) HQ 164 Universe on a Scratchpad (work of a modern day astrophysicist), 28 min, 1967.

(4) Other Films*

(a) Excellence by Design (engineers explain their work), 15 min, color, 1966. McDonnell-Douglas Corp.

(b) The Lockheed-Georgia Company (a briefing film on the activities of the company), 15 min, updated periodically.

(c) Prelude to Tomorrow (work of scientists, engineers, and technicians), 15 min. TRW Systems Group.

(d) This Business is People (employees of Lockheed-Georgia), 18-1/2 min, 1965. Lockheed-Georgia Company.

(e) This Could be You (explains the steps it takes to get a private pilot's license), 27-1/2 min. Piper Aircraft Corp.

* Note on obtaining "Other Films"

Try to make your requests several months in advance. The addresses for the companies which provide the films listed above are:

Lockheed-Georgia Company
Motion Picture Film Library
Zone 30, B-2 Building
Marietta, Georgia 30060

McDonnell-Douglas Corp.
Film Library, Department 92
Building 240
P.O. Box 516
St. Louis, Missouri 63166

Piper Aircraft Corp.
Film Department
Lock Haven, Pennsylvania 17745

TRW Systems Group
Attn: Motion Pictures
Building 65, Room 1521
One Space Park
Redondo Beach, California 90278

7. PROJECTS:

a. If you have girls in your class, one of them may want to report on traditional jobs available to women in aerospace--stewardess, ticket agent, airlines secretary, Air Force nurse--while another could report on women moving into formerly all-male fields (airlines pilot, aircraft mechanic, Air Force security policewoman, Air Force chaplain--to name a few).

b. A field trip to the nearest airport or aerospace company could stimulate interest in aerospace career information. This would give students the chance to question workers on what their feelings are about their jobs.

c. Assign a student to choose a profession or occupation in his community and compare his chosen profession or skill to a comparable one in the United States Air Force. Have each student do a study and compile the duties, responsibilities, training needed, working hours, pay, advancement, retirement and other important things related to the civilian and military jobs. After sufficient evidence is gathered, each student could write a short report stating the advantages and disadvantages of the military versus the civilian occupation. The best reports could be presented orally to the class by the students who wrote them. If at all possible, present both sides, i.e., a student who views the civilian job as better than the military and a student who sees the military job as better than the civilian.

8. FURTHER READING:

a. High School News Report--Basic Facts About Military Service.

b. AFM 36-1

c. AFM 39-1

d. Your Place in the Air Force.

e. "Return of the Stewardesses," TSgt Jim Caldwell, Airman, December '73, p 43-45.

f. Latest information available from recruiters of all services.

g. For other sources, see the chapter.

IDEAS FOR IMPROVEMENT OF THE TEXTBOOK AND/OR INSTRUCTOR'S GUIDE
AND TEACHING TECHNIQUES MOST EFFECTIVE FOR THIS CHAPTER:
TO BE COMPILED AT END OF TEXT AND SENT TO JRC

AEROSPACE COMMUNITY